

Mahseer sanctuaries of Meghalaya: A conservation and recreational perspective

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An adult red finned mahseer, *Tor tor*.

Meghalaya is one of the eight states of Northeast India encompassing an area of approximately 22,430 km². The state is considered as the wettest place on earth, experiencing an average annual rainfall as high as 12,000 mm, and therefore leading to the name Meghalaya, which means “the abode of clouds” in Sanskrit language. The state is bounded by Bangladesh on the south and west side and by the state of Assam in the north and east part. The state has a rich biodiversity in terms of flora and fauna due to varying climatic conditions and 70% of the state is covered by forest featuring high plateaus, gorgeous waterfalls, crystal clear river basins and their meandering rivulets and streams. These pristine water bodies provide ample scope for commercial fisheries in the state.

The indigenous tribes of Meghalaya viz., the Khasis, Garos and Jaintias, are skilled in fishing by various means for their consumption and recreation. But these also create the risk of over exploitation of natural resources and decline of entire fish populations. Therefore, to conserve the fish species in their natural conditions, the concept of establishing fish sanctuaries in the state was raised.

A sanctuary is a place of safety, a nature reserve where endangered and threatened species are cared for and fishing is prohibited. These sanctuaries have been established with an objective to preserve and enhance aquatic biodiversity, protect the fish species, preserve breeding and feeding

grounds, restore declining stocks by artificial propagation and serve as a tourist attractions to benefit the local rural people and improve their livelihoods (MASM, Govt. of Meghalaya). In order to fulfil these objectives an array of initiatives has been taken in the form of awareness raising programs to encourage local people to conserve the local wari, now affirmed as fish sanctuaries, to protect the decreasing population of indigenous species. A total of 54 sanctuaries have been established since 2012 in Garo, Khasi and Jaintia hills of Meghalaya (Table 1) under the Meghalaya State Aquaculture Mission (MASM) project propagated by the Fish Farmers Development Agency. Funding is provided under the project to construct a view point for the sanctuary under the jurisdiction of the District Administration and Department of Fisheries.

Table 1: Distribution of mahseer sanctuaries in Meghalaya (data to July 2018).

Districts of Meghalaya	No. of sanctuaries
East Khasi hills	13
West Khasi hills	5
Jaintia hills	7
Ri-Bhoi	4
South Garo hills	12
East Garo hills	8
West Garo hills	5



Mahseer population in Nengmandalgre sanctuary.

Moreover, conservation measures are being undertaken by the Government of Meghalaya and NGOs to rekindle the mahseer stock in many of the river systems such as the Simsang and Ganol river routes. The mahseer stock of these sanctuaries are dominated by chocolate mahseer (*Neolissochilus hexagonolepis*), but some others such as golden mahseer (*Tor putitora*), red finned mahseer (*Tor tor*) are prevalent.

In this context, it will be worth mentioning herewith that the chocolate mahseer of family Cyprinidae is the pride species of Meghalaya and is widely recognised as a sport fish, apart from its food value. This fish is also rated as an ornamental fish in its juvenile stage. The flesh of chocolate mahseer is highly relished by the people of Meghalaya and Northeastern region of India due to its well flavored and nutritious nature. With a high n-3 poly unsaturated fatty acid (21%) and essential amino acid content (Sarma et al., 2013) chocolate mahseer is considered as a nutritive fish for human health. The species has gained the urgent attention of researchers and conservationist during the past 20 years due to its rapidly declining population. There are concerns about its reduced population due to anthropogenic pressures, pollution, unregulated and destructive fishing methods. As a result, chocolate mahseer was been declared as a “Near Threatened” species by IUCN in 2010.

This article seeks to gather the available information regarding the present status of chocolate mahseer and the conservation measures been undertaken in the East Garo Hills of Meghalaya up until 2018. The information was collected by a team of scientists from ICAR-DCFR, Bhimtal

by conducting field surveys of four fish sanctuaries in the East and West Garo Hills, namely Nengmandalgre, Rongsakgre, Bansangre and Songkalwari-Rombagre with the co-operation and logistical support from the Deputy Commissioner and State Fisheries Officers of Willimnagar.

The sanctuaries attract tourists with their beautiful location, crystal clear water and the presence of thousands of chocolate mahseer. The fee for visiting a sanctuary is INR 5.00 per person in certain regions or is free. Each of these sanctuaries is maintained by the local villagers by electing a working President, Secretary and members for its care and management. The management practices inside a sanctuary include the feeding of fishes with puffed rice, ripe jack fruit and cleaning of the premises. Moreover, the management authority is also responsible for constituting strict rules for the conservation of the sanctuary which include a ban on fishing of any kind and heavy penalties and imprisonment for anyone found in violation of the rules. The penalty criteria differs from one sanctuary to another, for example in Nengmandalgre sanctuary the fine is levied to a poacher is INR 15,000, one cow and a bag of rice, whereas in Rombagre it is INR 10,000, a cow, a pig, a bag of rice and sugar. The villagers also catch the fish once in a year from areas nearby, but not in, the sanctuary sites. It was observed that the fish are not found or sold in the local markets. In certain places of the East Garo Hills namely Bangsangre, Somagre, Rongsogre and Samunda, the local people sell the fishes at a very high price of INR 1,000 per kg in their villages.



An adult chocolate mahseer.



Above: Nengmandalgre santaury, Williamnagar, Meghalaya. Below: Chocolate mahseer farm pond of of Mr Semburtush Momin at Rombagre.



The culture of chocolate mahseer is at a low level in the Garo Hills. People generally prefer to culture other carps such as rohu, common carp and catla, for which seeds are readily available round in the year in the neighbouring state of Assam. A very few farmers were seen to have adopted the farming of chocolate mahseer in the Garo Hills by collecting mahseer seed from the wild. The lack of seeds and of an established fish hatchery in the region is the major constraint for uptake of the culture of chocolate mahseer. Therefore, the culture practices of chocolate mahseer are not much popularised in the Garo Hills and thus the fishes are largely restricted to sanctuaries. However, modifications have been seen with the culture fisheries of mahseer in the rearing systems of Mr Semburtush Momin at Rombagre. This farmer has been cultivating the fish since 1973 in ponds near to the Simsang River in a flow through system. The ponds are supplied with a continuous flow of water over a gravelly bottom in order to simulate a natural river environment. The mahseer seed are either collected from the wild or self-recruit through natural spawning in the pond. The mahseer seeds are being cultivated with carp seeds in the same pond and the discharged water is drained to an integrated unit of rice culture with fishes. This shows a perfect example of water management as practiced by the farmers of Meghalaya.

Conclusion

Chocolate mahseer is a very popular, preferred and highly priced fish in the entire Northeast region of India. The major limitations for its successful commercialisation in the Himalayan region are the lack of seed availability, infrastructure facilities with adequate water flow and the availability of low cost feed. Investigations on developing protocols for the captive propagation of this species have been carried out over the past years to obtain better knowledge on spawning biology, ecological aspects and behavior in its natural habitat. This resulted in the development of seed production and hatchery technology of the species using gravid brooders from the wild. The initiative of ICAR-Directorate of Coldwater Fisheries Research, Bhimtal has opened avenues for the possibility of culture of chocolate mahseer in pond systems, offering a potential opportunity to strengthen the aquaculture production. A hatchery has been established at Tura, West Garo Hills District, Meghalaya, for continuous seed production and ready supply to the fish farmers of the state.

References

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View point of Nengmandalgre santuary.